

**SHIP PRODUCTION COMMITTEE
FACILITIES AND ENVIRONMENTAL EFFECTS
SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
MARINE INDUSTRY STANDARDS
WELDING
INDUSTRIAL ENGINEERING
EDUCATION AND TRAINING**

**September 1991
NSRP 0340**

THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

**1991 Ship Production Symposium
Proceedings:
Paper No. IXB-3
A Summary Report: A Survey of the
Principal Elements of Safety Pro-
grams at Nine American Shipyards**

**U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER**

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE SEP 1991		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE The National Shipbuilding Research Program, 1991 Ship Production Symposium Proceedings: Paper No. IXB-3: A Summay Report: A Survey of the Principal Elements of Safety Programs at Nine American Shipyards				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center CD Code 2230-Design Integration Tools Bldg 192, Room 128 9500 MacArthur Blvd, Bethesda, MD 20817-5700				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 9	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS
601 Pavonia Avenue, Jersey City, N.J. 07306

Paper presented at the 1991 Ship Production Symposium,
The Pan Pacific Hotel, San Diego, California, September 3-6, 1991.

A Summary Report: A Survey of The Principal Elements of Safety Programs at Nine American Shipyards

IXB-3

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ABSTRACT

The Survey, which is the subject of National Shipbuilding Research Program (NSRP) Publication #0318 and of this paper, was sponsored by Panel SP-5, Human Resource Innovation. It was designed to collect a significant amount of detailed information concerning the principal elements of safety programs currently in effect in major American shipyards so as to:

identify the core elements common to all or most of such safety programs:

identify the managerial philosophies that underlie such programs:

- provide base line information so that participating yards and others in the industry can make comparisons and evaluations of their own safety programs; and
- bring about an awareness throughout the industry of new initiatives that have been tried and found successful in one or another shipyard and an awareness of experiments which are taking place with new and/or changed technologies designed to have a positive influence on safety program goals.

The ultimate objective of the project is to prevent occupational injuries and illnesses and thereby avoid their costs, including medical, workers' compensation and lost production costs.

BACKGROUND

There is general acceptance of the observation that each shipyard in the industry has its own personality. That personality is the product of many factors including the yard's history, its size, its organizational structure, its employee relations atmosphere and its management style. It is dynamic, not static, and adjusts to internal and external influences. Each yard, therefore, develops and implements its policies and procedures, including those governing occupational safety and health matters, in a manner that suits its personality. Although external influences may

have contributed to the development of a particular yard's safety program and elements thereof (for example, the U.S. Navy's influence on safety programs in the public shipyards), the extent to which and manner in which those influences are made manifest are affected by the yard's personality. It has often been said that what works in one yard may not work in another. Each yard is the best judge of what will work for it.

In full recognition of the above, attempts have been made over the years to gather, at a central source, safety program information from the yards in the industry so that individual yards could examine what others were doing, make their own **evaluation** of the applicability and efficacy of the data, and thereby enhance their self evaluation process. However, to the best of Panel SP-5's knowledge, no really satisfactory collection of such data had heretofore been accomplished.

Because of the competitive nature of the firms in the industry and the historic arms-length relationships that have developed among and between them in sensitive areas that affect the bottom line, there historically has been limited formal exchange of detailed information as to the principal elements of safety programs. That is not to say, however, that the shipyard experts in safety and health matters do not meet from time to time to exchange information. On the contrary, information is exchanged in regional and national meetings of the National Safety Congress, and in regular meetings of the Health and Safety Committee of Shipbuilders Council of America, to name but two.

Exchanges of such information between private and public shipyards, however, have been virtually non-existent. Indeed, public shipyards are not members of Shipbuilders Council of America.

Further, the kind of information that has been exchanged, and that has been made available through the National Safety Congress, the Department of Labor and others, usually deals with the measurements of performance in certain narrowly defined fields like lost work day and lost work cases incidence rates, expressed as a factor of numbers of manhours worked. The exchanges of data and the publication of data rarely go to the factors that affect the environment in which those statistics are created.

THE SURVEY DOCUMENT

Panel SP-5 recognized that because of its human resource concentration and its diverse membership, it was in a unique position to accomplish the data accumulation that had for so long been elusive.

The Panel established an ad hoc committee whose function was to design a survey document that would achieve the objectives set forth above under the abstract of this paper. That committee sought from the Panel's member yards a list of suggested questions to be included in the survey document. Exercising the expertise in safety program design possessed by the individual ad hoc committee members it created the survey document drawing from a list of questions submitted by Bethlehem Steel/Sparrows Point, General Dynamics-Electric Boat and Norfolk and Puget Sound Naval Shipyards in response to its request.

In a presentation made during the Third National Workshop on Human Resource Innovation on October 16, 1991, Joseph Collier, Director of the Office of Consultation Programs for the Occupational Safety and Health Administration, discussed the central core requirements which underlie the safety and health management aspects of OSHA's Voluntary Protection Programs (VPPs). Those core requirements are expressed in what is called a "Guideline" on safety and health management that has been published in the Federal Register. It is a voluntary guideline in the sense that it is not a standard that OSHA requires companies to follow, but one that it recommends be followed. The four basic guidelines are:

- Management commitment and employee involvement;
- Worksite analysis;
- Hazard prevention and control; and
- Safety and health training.

Of primary importance in any safety and health program is a policy statement making clear the company's commitment to safety: that safety is as important as production. Employee involvement includes labor-management committees that are meaningful and active and get the employees involved in the structures, operations and decisions affecting their safety and health. Assignment and communication of responsibility is important so that everybody in the workplace knows what is expected of him or her and understands what he or she is expected to do so there is no confusion or overlap. Along with the assignment and communication of responsibility is the giving of adequate authority and resources to carry out that responsibility. There must also be a system for all managers, supervisors and employees to be held accountable for what they have been assigned to do.

That involves rewards and corrections.

The second major factor is worksite analysis, involving, first of all, comprehensive surveys to set a baseline of data about what kinds of hazards are present in the workplace. Another critical part of the effort is that whenever change is to be made in the facilities, equipment, materials or processes of the site, safety and health issues are taken into account. Safety and health people should be involved with the architects and engineers and others who are planning the manufacturing process or the assembly process to take into account, up front, the hazards that might be put into place by these changes, and to be sure that there are preventions or protections for them. Also included in worksite analysis is routine hazard analysis, including phase hazard analysis in situations when one moves from one place to another. Finally, provisions should be made for routine, regular safety and health inspections and reliable systems for employees to report hazards: participation of employees and others in investigating accidents and near-misses; and analyzing patterns of injuries and illnesses and addressing them.

The third major factor is hazard prevention and engineering and administrative controls. Preventive maintenance is also included, to be sure that machinery does not become hazardous because of breaking down or whatever, and finally, emergency planning and a medical program.

And then, under safety and health training, the key concerns are (1) that employees understand the hazards to which they and their fellow employees are exposed and understand their role in preventing anyone from being hurt because of the hazards, (2) that supervisors understand their responsibilities to identify and correct hazards, to maintain the physical protections that are placed in their work areas, to reinforce employee training through feedback, and to enforce rules, and (3) that managers understand their role in the process of safety and health.

The survey document covers each of the items in those Guidelines in depth. It contains eighty-five distinct questions many of which have multiple parts and many others of which called for essay type responses. Indeed, it is estimated that a typical participating shipyard responded to well over 300 questions in the body of the survey document and to twelve additional multiple part questions in the Appendix concerning Safety Training Programs.

YARDS INCLUDED IN THE SURVEY

The following twelve shipyards, eight private and four public, were asked to participate in the survey:

Avondale
Bath Iron Works
Bethlehem Steel/Sparrows Point
General Dynamics-Electric Boat
Ingalls

Mare Island Naval Shipyard
NASSCO
Newport News
Norfolk Naval Shipyard
Norshipco
Philadelphia Naval Shipyard
Puget Sound Naval Shipyard

Each yard was advised that, in order to maintain anonymity, individual shipyards would not be identified in the report. Where specific reference was necessary or desirable, an individual shipyard would be referred to by an arbitrarily assigned number.

Initially, all twelve shipyards agreed to participate and, upon invitation, each of them was visited by the author for the purpose of reviewing the survey document, in a face-to-face setting, prior to final completion and return. Three of the twelve shipyards, two private and one public, without notification or explanation, failed to return a completed questionnaire. The report, therefore, contains the responses of those nine shipyards. They comprise an excellent and representative cross section of the United States shipbuilding industry.

THE SURVEY

When responses to the survey document were received, recorded and compiled, a draft report was sent to each participating yard requesting that it check the accuracy of the data reported for it. After a second exchange of comparisons a meeting was held to provide all participating yards the opportunity to review and compare responses and to discuss safety and health matters beyond the scope of the Survey itself in advance of the publication of the report. That meeting has been referred to as the New Orleans meeting.

It is impossible in a Paper of this nature to comment on the data as a whole (because of the mass of it) or even to select the most important for comment because each piece of data is an integral part of the whole just as each piece of a safety program is an integral part of the total program. As a reminder, there were eighty-five distinct questions, many with subsets, covering every conceivable aspect of a shipyard safety and health program.

Nevertheless, at the conclusion of the New Orleans meeting the shipyard representatives at that meeting engaged in an interesting exercise of prioritizing the elements of safety programs, using as a rough guide a shorthand version of the eighty-five distinct questions in the survey document. The object was to place, by consensus, the elements into one of the following three groups:

Group 1- Basic Core Elements

Group 2 - Elements essential to be a complete safety program (Enhancements of Basic Core

Elements): or

Group 3 - Complementary elements to those considered essential but to a lesser extent than those in Group 2.

When consensus was achieved as to which elements belonged in which Group, participants then prioritized the elements within groups. An element rated (1) was given the highest priority, (2) the next highest and so on. Those elements which the attendees agreed belonged in Group 1 and the order in which they ranked them are as follows:

- (1) Top Management maintains active involvement on a daily basis in safety and health matters.
- (2) Safety and health are integrated into daily operations.
- (3) Supervisors are held accountable for safety and health.
- (3a) Safety and health performance is daily responsibility of line supervision.
- (4) Safety and health are incorporated in other shipyard policies.
- (4a) Overall safety and health responsibility is fixed in shipyard.
- (4b) Primary responsibility for safety and health is fixed.
- (5) Shipyard has adequate medical treatment for injured employees.
- (6) Discipline is used for noncompliance with safety and health standards.
- (7) All shipyard employees receive initial safety and health training.
- (8) Shipyard has a safety and health policy.
- (8a) Safety and health decisions are consistent with overall shipyard goals.
- (9) Supervisors are rewarded (positive or negative) for safety and health performance.
- (9a) Supervisors are frequently apprised of safety and health performance.
- (9b) Safety and health standards are communicated to line supervision.
- (9c) Supervisor's safety and health performance is measured.
- (9d) Shipyard has other adequate systems to measure safety and health performance.

- (10) Comprehensive accident investigation takes place with follow-up.
- (11) Safety and health performance data is on agenda of management meetings.
- (12) Employee protection is afforded through engineering, administrative controls and personal protective equipment.
- (13) Safety and Health Director is adequately placed in shipyard organization.
- (14) Managers/Supervisors can stop unsafe work.

Again it should be noted how precisely this prioritization parses with the Guidelines cited by OSHA's Mr. Collier referred to earlier.

The Survey Report also commented on the importance of top management's commitment. It observed that in order for any safety program to be effective it must be reflective of, and be guided by, the organization's philosophy and policy in occupational safety and health (OSH) matters. That policy must be known to, and clearly understood by, all members of the organization. There is no room in an effective safety program for ambiguity in top management's dedication of purpose. A formal written statement setting forth an organization's guiding principles, its objectives and its policy to achieve those objectives is a first step in eliminating ambiguity. The larger the organization the greater the difficulty in informing and educating the members, hence, the greater need for committing the policy to writing. The fact that the organization is willing to commit its policy to writing in and of itself sends a message of its sincerity.

While the lack of a written statement of policy, all other things being equal, would not invalidate an otherwise sound safety program that absence would be conspicuous to those inside and outside of the organization and would send an improper or, at best, ambiguous message which, as noted above, is to be avoided at all costs.

Eight of the yards submitted statements of safety policy in the form either of policy as part of its formal Safety Program or of a stand alone document such as a letter from the Chief Executive Officer to all employees or a Memorandum of Policy. As might be expected those statements of policy varied in degree of elaboration from the very complete to the more concise. The following is an example which contains the essential elements reflected in all of them.

"It is the policy of [yard] to establish and maintain a comprehensive Occupational Safety and Health Program which is based on the following principles:

- a. Our people are our greatest asset.

- b. Safety is an inseparable part of all shipyard operations, and will be appropriately integrated into all work and training activities.
- c. All occupational injuries and illnesses can be prevented through recognition and prevention of hazards. Our goal is continuous long term improvement in injury/illness prevention.
- d. We will comply with the OSH regulations which are applicable to our operations.
- e. All employees must be involved in recognizing and preventing hazards, and complying with OSH requirements applicable to their work.
- f. Managers and supervisors at all levels are responsible for the safety of the people and operations within their areas of responsibility.
- g. Planning/technical personnel are responsible for determining OSH hazards and requirements associated with planned operations, and for incorporating appropriate OSH provisions into plans and procedures for accomplishing the work.
- h. We will establish systems to objectively measure our progress in achieving long term improvement."

An example of a more concise statement is as follows:

"It is the policy of this Shipyard that all employees will be provided with a safe and healthful work environment, which is free from recognized hazards and consistent with current federal, state and local standards."

All yards indicated that safety and health considerations were integrated into functional procedures affecting operations throughout the shipyard. Examples of some of the responses follow:

- "All policies are subject to a Safety First condition."
- "Occupational Safety and Health is included in the guiding principles of the shipyard's Total Quality Management program."
- "The performance of [shipyard] is measured by only one set of criteria-whether or not we perform quality work on schedule, at low cost in a safe manner."

Most yards also indicated that at their operation ultimate responsibility for overall safety and health performance rests at the top of the organization. The yards were unanimous in their view that, contrary to the belief held in some circles, ultimate responsibility does

not rest in the Safety Office.

Recognizing that the causes of all accidents fall into two basic categories-unsafe conditions and unsafe acts-it is generally held that management is responsible for providing safe working conditions and employees are responsible for acting in a safe manner. Beyond those considerations it is generally acknowledged that management has a responsibility to ensure that employees are aware that certain acts are unsafe and are aware of ways to avoid them. Management fulfills that responsibility by providing formal and informal training, both on-the-job and in classroom: it ensures that first and second line supervisors are similarly aware and it holds those supervisors accountable for their own safety and health performance and the safety and health performance of the employees under their supervision. Management also imposes discipline on employees and supervisors who perform unsafe acts and supervisors who tolerate or condone the performance of unsafe acts.

While all of the yards indicated that they review their supervisors' safety and health performance, the time periods for such performance reviews vary considerably. All yards do, however, apprise supervisors of their performance whenever it varies from an acceptable standard and also, at all yards, that standard has been made known to supervision.

The Survey revealed that the qualifications of safety personnel are governed by written standards at each operation and are not merely a reflection of the qualifications of the employees currently filling the billets.

The ratio of full time safety and health personnel to "blue collar" worker varied from one per 210 to one per 670 with an average for the nine yards of one per 470. No conclusion should be drawn from the different ratios. However, the ratio is a factor at least in training and other administrative areas which bear on the safety program and in specific areas of emphasis. On the other hand, a higher ratio may reflect that some safety responsibilities have been shifted to others.

Questions with respect to personal protective equipment (PPE) elicited some unexpected results. In the public shipyards employees do not pay the cost of any PPE required to be worn: in the private shipyards practices vary from yard to yard, and the Survey indicates for each private yard which items of PPE are furnished at no cost to the employees and of which the employees must pay all or a portion of the cost.

Seven of the nine yards responded to the question "What is your annual personal protective equipment cost per employee?" The responses ranged from a low of \$83 to a high of \$430 with an average cost of \$217. One yard did not provide a dollar cost figure because its accounting practices did not readily identify such costs and the other yard, for its own reasons, chose not to provide them.

One would assume that the public yards, as a group, would have PPE costs significantly higher than those of the private shipyards. The fact is, however, that the public yards show a lower than average cost and the private shipyards show a greater than average cost, just the opposite of what one would expect.

At first reading it would appear that there is an inconsistency between requiring employees to buy certain of their own personal protective equipment and a claimed managerial dedication to safe working conditions and practices. The information does not, however, support a conclusion of such inconsistency. The information reflects historical customs and practices at the various yards. The point to be stressed here is that this information reflects different purchasing practices and not different required use practices. Where practices in the yards are similar in respect of mandatory use of certain items of personal protective equipment, it is really irrelevant from a safety and health standpoint whether the management provides it or the employees purchase their own-the amount of protection provided is the same.

CONCLUSION.

Perhaps the most important single element of any safety program is the dedication with which the organization implements and enforces its formal written statement of occupational safety and health policy. The antennae of the members of an organization are keenly sensitive to the parallelism between policy and its implementation. Deviations from parallel do not go undetected. Repeated deviations without adequate explanation force questions, verbalized or mute, as to whether the policy is both words and actions or words without action.

Top management's consistent active involvement in policy implementation as reflected in the safety program is crucial to the effectiveness of that program. The degree of its involvement is observed and evaluated on a daily basis by employees at every level in the organization. If employees at any level perceive that the organization's actual commitment is less than indicated in the statement of policy, that perception will govern their conduct and the program will suffer.

The consensus of the representatives at the New Orleans meeting was that the degree of top management commitment and involvement at the yards which participated in the Survey would range from some active personal involvement in some of the yards to significant active personal involvement in some others. It is questionable that any of the yards, save one, would compare favorably to a standard of strong active personal involvement. One yard's top management demonstrates outstanding personal involvement

bordering on zealotry. It was also the consensus that that is the standard against which all yards should be measured.

REFERENCES

- National Shipbuilding Research Program
Publication #0318.
- Occupational Safety and Health
Administration, Voluntary Protection
Programs' Guidelines.

Additional copies of this report can be obtained from the
National Shipbuilding Research and Documentation Center:

<http://www.nsnet.com/docctr/>

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